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INTERNATIONAL APPLICATION NO.
PCT/EP97/02645INTERNATIONAL FILING DATE
May 23, 1997PRIORITY DATE CLAIMED
June 3, 1996TITLE OF INVENTION
SURFBOARD OR SAILBOARD AND METHOD FOR THE MANUFACTURE THEREOF

APPLICANT(S) FOR DO/EO/US

Colin Patterson

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☐ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
 - a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☒ has been transmitted by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
 - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☐ have been transmitted by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☒ have not been made and will not be made.
8. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern document(s) or information included:

11. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A **FIRST** preliminary amendment.
☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
14. ☐ A substitute specification.
15. ☐ A change of power of attorney and/or address letter.
16. ☐ Other items or information:

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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Peter Rapp and Colin Patterson
Title: SURFBOARD OR SAILBOARD AND METHOD FOR THE
MANUFACTURE THEREROF
International
Application No.: PCT/EP97/02645
International
Filing Date: May 23, 1997
Docket No.: 30605

PRELIMINARY AMENDMENT

Attn: Box PCT
Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Please amend the above-identified application prior to
its examination, as follows.

IN THE CLAIMS:

On page 1 of the claims, at the top, delete "Patent
Claims" and insert therefore --WHAT IS CLAIMED IS:--.

Please cancel claims 1-21 without prejudice and add new
claims 22-42 as follows.

1 22. Surfboard having an essentially elongate, flat basic
2 body which is capable of floating and, during use, rests with
3 its underside on the water, and on whose upper side there is
4 provided a standing surface for the feet of the sports person

5 using the board, at least one fin being attached to the
6 underside, wherein an opening extending from the underside
7 towards the upper side is provided in the basic body
8 for receiving the said fin.

1 23. Surfboard according to Claim 22, wherein the extent
2 of the said opening in the transverse direction of the board,
3 that is to say transversely to the direction of travel and
4 transversely to the surface plane of the fin, is less than the
5 cross-section of the fin, and wherein the outer edges of the
6 fin cross-section at the connection point to the board are
7 designed in such a way that the outer edges rest essentially
8 completely against the underside of the board.

1 24. Surfboard according to Claim 22, wherein the fin is
2 attached in the said opening by an attachment means.

1 25. Surfboard according to Claim 24, wherein the said
2 opening has a longitudinal extent essentially in the
3 longitudinal direction of the board, which is greater than the
4 extent of the attachment means in the longitudinal direction,
5 so that the attachment means and the fin can be moved in the
6 longitudinal direction in the said opening when the said
7 attachment means has been loosened.

1 26. Surfboard according to Claim 24, wherein the said
2 attachment means is a screw which is provided with a screw
3 head, and wherein the said opening has a resting surface on

4 which the said screw head rests in order to hold the said fin.

1 27. Surfboard according to Claim 22, wherein the said
2 opening is designed in the form of a fin box which penetrates
3 the said basic body.

1 28. Surfboard according to Claim 27, wherein the fin is
2 attached in the said opening by an attachment means, and
3 wherein the said fin box has a box top part which is open
4 towards the upper side of the surfboard, and a box bottom part
5 which is open towards the underside of the said surfboard, and
6 wherein a plate is arranged between the said fin top box and
7 the said fin bottom box, in which plate the said opening is
8 provided, and through which the said attachment means engages.

1 29. Surfboard according to Claim 28, wherein the said
2 box top part consists of two opposite side walls which are
3 arranged essentially parallel to the longitudinal direction of
4 the surfboard and which are connected to one another by two
5 shorter cross walls.

1 30. Surfboard according to Claim 28, wherein the said
2 box bottom part has two longitudinal walls running essentially
3 parallel to the longitudinal direction of the surfboard and
4 two short cross walls which connect the latter.

1 31. Surfboard according to Claim 22, wherein the said
2 fin has a journal which engages in the said opening.

1 32. Surfboard according to Claim 28, wherein the said
2 fin has a journal which engages in the said opening, wherein
3 the said journal has side walls and is of essentially cuboid
4 design, wherein said fin box has side walls, and wherein the
5 said opening in the said box bottom part is designed in such a
6 way that, in the assembled state of the said fin, the side
7 walls of the said journal rest essentially against the side
8 walls of the said fin box.

1 33. Surfboard according to Claim 22, wherein a seal is
2 provided between the surface of the fin, which faces the
3 underside of the surfboard, and the surfboard.

1 34. Surfboard according to Claim 22, wherein an opening
2 provided with a threaded bore is provided in the said fin for
3 engagement of an attachment means provided with a threaded
4 bore.

1 35. Method for the manufacture of a surfboard having an
2 essentially elongate, flat basic body which is capable of
3 floating and, during use, rests with its underside on the
4 water, and on whose upper side there is provided a standing
5 surface for the feet of the sports person using the board,
6 wherein an opening extending from the underside towards the
7 upper side is provided in the basic body for receiving a fin,
8 the said opening being formed in a moulding which is
9 manufactured independently of the surfboard and which is

10 integrated therein during the manufacture of the surfboard.

1 36. Method according to Claim 35, wherein the surfboard
2 is manufactured by the said moulding being inserted into a
3 mould which has a mould cavity which essentially corresponds
4 to the shape of the said basic body, and wherein, after the
5 said moulding has been inserted into the mould, the mould is
6 closed, a foaming medium being introduced into the mould
7 before, during or after the closure of the mould, which
8 foaming medium expands in the mould cavity and, in the
9 process, essentially forms the said basic body.

1 37. Method according to Claim 36, wherein the said
2 foaming medium is of such a type and is introduced into the
3 said mould cavity in such a quantity that the foam produced
4 essentially completely forms the said basic body.

1 38. Method according to Claim 36, wherein at least one
2 body consisting of plastic material which, in the finished
3 state, forms at least part of the outer surface of the
4 surfboard, is placed in the said mould.

1 39. Method for the manufacture of a surfboard according
2 to Claim 35, wherein the said moulding is designed as a fin
3 box, and wherein the said fin box is manufactured from plastic
4 material in a plastics manufacturing method.

1 40. Method according to Claim 39, wherein the said

2 plastics manufacturing method is an injection-moulding method.

1 41. Method for the manufacture of a surfboard having an
2 essentially elongate, flat basic body which is capable of
3 floating and, during use, rests with its underside on the
4 water, and on whose upper side there is provided a standing
5 surface for the feet of the sports person using the board, at
6 least one fin being attached to the underside, wherein an
7 opening extending from the underside towards the upper side is
8 provided in the basic body for receiving the said fin, wherein
9 firstly the basic body of the surfboard consisting of a
10 plastic upper shell, plastic lower shell and foam located
11 between them is manufactured at least to a great extent,
12 wherein cutouts are then made in the said basic body, and
13 wherein laminates are then introduced into the said cutouts,
14 which laminates, in the cured state, form a fin box.

1 42. Method according to Claim 41, characterized by the
2 use of mouldings which preferably consist of aluminium and
3 which are arranged in the said cutouts with the said laminates
4 in such a way that, in the cured state, the laminates have the
5 desired shape after removal of the said mouldings.

REMARKS

The claims have been amended to eliminate multiple dependency, cure certain informalities, and further refine the language.

The Commissioner is hereby authorized to charge any fees under 37 C.F.R. §§1.16 and 1.17 which may be required during the entire pendency of this application, or to credit any overpayment, to Deposit Account No. 16-0820, Order No. 30605.

If any fees are required by this communication, please charge such fees to our Deposit Account No. 16-0820, Order No. 30605.

Respectfully submitted,

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Date: Jan. 30, 1998

Surfboard or sailboard and method for the
manufacture thereof

The present invention relates to a surfboard or sailboard and a method for the manufacture thereof.

A surfboard is to be understood to mean all customary, essentially flat floating bodies which are suitable for surfing. Sailboards are understood to be the essentially flat floating bodies which are or can be fitted with a sail and are used for windsurfing and the like. For reasons of simplicity, the invention is described below by way of the example of a surfboard for surfing. However, it is pointed out that this does not mean any restriction for the applicability of the invention.

To stabilize the direction, surfboards and sailboards require a so-called fin, a plate which is often of essentially triangular design and whose plane is arranged essentially parallel to the plane of the direction of travel. In addition to the triangular basic shape of the fin, there are numerous modifications, e.g. a design in the manner of the centre-board of a sailing boat, a design in which lines are greatly curved counter to the direction of travel, etc. In addition to the triangular basic shape, rectangular or trapezoidal shapes with straight or curved side edges are also possible.

Surfboards and sailboards are generally made of a plastic material, for example epoxy resin, ABS or similar materials which form the actual rump or body and surround a core made of foamed material, such as polystyrene or polyurethane. Since, for various reasons, the boards have to be designed to be as light as possible, the actual plastic skin can also be of not very thick construction. This therefore causes the

problems of mounting the fins on the board with sufficient strength.

In a known type of attachment for fins, an approximately cylindrical depression is arranged on the underside of the board, into which depression the fin is inserted with an elastic bracket of correspondingly cylindrical design. The bracket is expanded by a screw and is thus clamped firmly in the cylindrical depression. However, this type of attachment has the disadvantage that it does not ensure a sufficiently secure attachment, and that it furthermore does not allow the position of the fin to be corrected in relation to the board. An adaptation of the fin position with regard to different external conditions is thus not possible.

An adjustable fin for a surfboard was disclosed by the American Patent 4,846,745. This fin is held in a groove which is arranged on the underside of the surfboard and has clamping devices for the attachment of the fin.

US Patent 4,421,492 likewise shows a fin which is adjustable in the longitudinal direction of the board, and in which a longitudinal groove is likewise recessed into the board. The fin can be displaced back and forth in holding grooves by means of pins and is held in the desired position by a spring-mounted part which engages in catch depressions on the underside of the groove. US Patent 4,044,416 also shows a similar construction to the two patents described above.

The abovementioned designs have the disadvantage that, on the one hand, they are relatively complicated and that, on the other hand, the strength leaves much to be desired.

The object of the present invention is therefore to provide a surfboard or sailboard with a fin

which can be mounted in a simple and reliable manner, and in which, at the same time, the connection between the fin and the surfboard has a high strength. According to a subsidiary aspect of the invention, it should also be possible to change the position of the fin in a simple manner.

It is furthermore the object of the invention to provide a method for the manufacture of such a surfboard or sailboard.

According to the invention, the object is achieved by the subject-matter of Claim 1. The method according to the invention is the subject-matter of Claim 13.

The surfboard or sailboard according to the invention consists of an essentially elongate, flat basic body which is capable of floating, rests with its underside on the water, and on whose upper side there is provided a standing surface for the feet of the sports person using the board. At least one fin is attached to the underside.

An opening extending from the underside towards the upper side is provided in the basic body for receiving the said fin. The extent of this opening in the transverse direction of the board, that is to say transversely to the direction of travel and transversely to the surface plane of the fin itself, is less than the cross-section of the fin at this point. Furthermore, the outer edges of the fin cross-section at the connection point to the board are designed such that the outer edges rest completely against the underside of the board.

It is achieved by this design that no projections, depressions or the like are provided on the underside of the board or on the fin, which have an in-

fluence on the course of flow of the water which flows around the fin and the underside of the board.

The actual attachment is effected by the fin being screwed to the board from above through the said opening.

This design has the considerable advantage that the attachment does not take place in the board itself. The strength of the fin is thus essentially independent of the strength of the plastic outer skin and also of the plastic foamed material. The region in which the opening is arranged merely has to be designed in such a way that the compressive stresses produced by the screw connection are reliably absorbed. The customary plastic foamed materials are very sensitive to tensile loads, but can withstand compressive loads comparatively well. The design therefore lends itself particularly to these material properties.

A screw connection fed through the board from above can be designed to be simple and easily accessible for the user. As a result, the fins can be removed in a simple manner which, for example, considerably facilitates transportation of the board. Furthermore, it is not a problem to exchange the fins in the event of fins of a given size being required for the respectively prevailing conditions of use, and it is likewise simple to exchange the fin quickly in the event of a breakage or the like.

According to a preferred further development of the invention, the opening through which the fin is screwed is designed as a slot which extends essentially in the longitudinal direction of the board. This design has the particular advantage that the position of the fin can be changed in relation to the sailboard. The slot is preferably designed such that it is completely covered by the fin even if the fin is in an extreme po-

sition defined by the ends of the hole. As a result, the fin can be implemented as an adjustable fin which, in contrast to the designs in the abovementioned prior art, does not affect the flow conditions on the underside of the board.

In particular, but not exclusively in the latter construction shown, the fin is preferably provided with an extension which engages in the slot. This extension has the advantage that it transmits any torque, which occurs during loading of the fin, to the board over a large area, thus avoiding damage to the board and fin.

The method according to the invention envisages providing a plastic body which is received in the surfboard, i.e. in the foamed material of the surfboard, and which has a first depression which is open towards the upper side of the board and in which the attachment, that is to say for example the screw head, is received, a second depression which is open towards the underside of the board, and an opening which connects the said first and the said second depression to one another.

According to a first preferred refinement of the method according to the invention, this plastic body is laminated into the board after the foaming of the board. For this purpose, depressions are milled into the board and, with correspondingly designed mouldings, glass-fibre mats impregnated with synthetic resin or the like are inserted and brought into shape.

According to a second preferred alternative of the method according to the invention, the plastic body is produced in advance, specifically preferably by an injection moulding method. This embodiment of the method according to the invention considerably reduces the expenditure for the manufacture of a surfboard. The

injection-moulded moulding is inserted in a suitable manner into the mould for the manufacture of the surfboard and is then foamed in during the manufacturing process. This results in a firm connection between the foam and the moulding.

By the use of the prefabricated plastic body, the force exerted by the fin attachment on the surfboard is considerably reduced and is essentially absorbed evenly by the foam. As a result, the strength requirements placed on the surfboard are reduced, such that it is possible to manufacture the surfboard without a plastic body. The surfboard then consists only of the corresponding foamed body, which considerably reduces the manufacturing costs. However, in this case it is possible to provide a part of the outer surface of the surfboard, in particular the standing surface for the user, with a plastic covering in order to increase the strength in this region or to achieve specific technical (high friction) or visual (specific colourings) properties.

The fin used according to the invention can likewise be made up as a laminate of fibre-reinforced plastic material. The attachment device is preferably implemented by a brass thread part also being laminated into the fin, which thread part interacts with a screw which is screwed to the fin through the moulding.

As an alternative thereto, the fin can also be manufactured as a plastic injection moulding. In this case, a suitable threaded bolt made of brass or the like is likewise inserted into the mould prior to manufacture and is also cast in.

Further advantages, features and potential uses of the present invention emerge from the following description in conjunction with the figures, in which:

- Figure 1a: shows a top view of a surfboard as an exemplary embodiment of the present invention, the fin having been omitted;
- Figure 1b: shows a side view of the exemplary embodiment according to Figure 1a;
- Figure 1c: shows a bottom view of the exemplary embodiment according to Figure 1a;
- Figure 2: shows a partially sectional side view of the exemplary embodiment according to Figure 1 with a mounted fin;
- Figure 3: shows a partially sectional end view of the exemplary embodiment according to Figure 2;
- Figure 4a: shows an illustration of the fin, as is used in the exemplary embodiment according to Figures 2 and 3 in a side view;
- Figure 4b: shows an illustration of the fin as is used in the exemplary embodiment according to Figures 2 and 3 in a top view;
- Figure 5a-d: shows individual stages for the manufacture of a surf board according to the exemplary embodiment according to Figure 1, Figure 5a and Figure 5c showing the manufacturing operation in a partially sectional side view, and Figure 5b and Figure 5d showing the manufacturing operation in a partially sectional end view;
- Figure 6a: shows a side view of an apparatus for the manufacture of the surfboard according to Figures 5a to 5d;
- Figure 6b: shows a view of the apparatus according to Figure 6a in an end view;

Figure 6c: shows the apparatus according to Figure 6a in the assembled state;

Figure 7: shows the fin box of the exemplary embodiment according to Figure 2 in a diagrammatic perspective view.

Figure 1a shows the top view of a surfboard 1 which is arranged essentially symmetrically to an axis 2 running in the longitudinal direction.

In the rear region of the surfboard there are three slots 3a, 3b and 3c, the slots 3a and 3c enclosing with their longitudinal axes an acute angle relative to the longitudinal axis 2, while the slot 3b is arranged symmetrically to the longitudinal axis.

Figure 1b shows a section through the surfboard according to Figure 1a, 5 denoting the upper side of the surfboard on which the user stands and 6 denoting the underside which faces the water.

Figure 1c shows a bottom view, the slots 3a, 3b and 3c also being visible here.

Figure 2 shows a section through the surfboard along the axis of symmetry of the slot 3b running in longitudinal directions.

As can be seen in this section, the surfboard 1 consists of a plastic upper shell 10, a plastic lower shell 11 and a foamed body 12 arranged between them. In the exemplary embodiment, the plastic upper shell and lower shell are produced from glass-fibre-reinforced synthetic resin and the foamed body 12 consists of polyurethane.

Recessed into this foamed body is the fin box designed according to the invention which, in this exemplary embodiment, represents an externally injection-moulded component, as is illustrated in detail in Figure 7.

The fin box denoted in total by 20 has a box top part 21 which consists of two opposite side walls 23 which are connected to one another by short cross walls 24 and which form an opening 26 which is open towards the top.

Designed integrally with this box top part is the box bottom part 30 which consists of two longitudinal side walls 31 running essentially in the longitudinal direction and of two short cross walls 32 and 33 which connect them and surround an insertion opening 34.

Towards the top, the fin bottom box is covered by an intermediate plate 35 which, at the same time, also terminates the fin top box 21 towards the bottom.

Arranged in the intermediate plate 35 is a slot 36 which extends essentially in the longitudinal direction and whose width is wide enough to receive a threaded screw 38. This threaded screw is provided with a head 39 which is suitable for the engagement of a tool, for example a screwdriver, and whose diameter is wider than the width of the slot 36.

The fin 40 has a front edge 41 which slopes essentially towards the rear in the assembled state and is curved towards the rear and a rear curved edge 42. The front edge 41 and the edge 42 are rounded in a suitable manner, as is customary in the case of wings and the like against which there is flow in order to reduce the flow resistance.

The upper edge 43 of the fin has such a design that, in the assembled state, the fin rests completely against the usually curved underside 6 of the surfboard.

For this purpose, at least the side edges 44, running in the longitudinal direction, and the transverse edges 45, running in the transverse direction of the edge 43 which terminates the fin at the top are adapted in their shape precisely to the course of the surface of the underside of the surfboard.

Additionally, a suitably designed intermediate sealing layer may be provided between the fin and the surfboard. A water-resistant elastic material, for example rubber or an elastic plastic material, is used as material for this intermediate sealing layer. The intermediate sealing layer is preferably cut in a shape which corresponds to the surface of the fin facing the surfboard, and which has appropriate cutouts for the lower opening of the fin box. As an alternative thereto, a depression may also be provided in the upper surface of the fin, which depression receives a sealing ring made of elastic material, such as rubber and the like.

A journal 46 is formed on the fin, integrally therewith, parallel to the longitudinal edge 44. The journal 46 is of cuboid design and has mutually parallel side surfaces 47, 48 and mutually parallel end faces 49. The thickness of the journal transversely to the longitudinal direction of the board in the assembled state, i.e. the distance between the outer surfaces 47 and 48, is smaller than the thickness of the fin, i.e. the distance between the outer surfaces 44 of the fin. As a result, a web denoted by 52 is produced between the journal and the upper edge of the fin. In the exemplary embodiment, the side surfaces of the journal are inclined slightly towards one another, that

is to say arranged conically, the opening in the underside of the fin box also being of correspondingly conical design. By virtue of this design, the fin is clamped firmly in the opening.

A threaded bolt 53 is made in the journal 46 of the fin 40. In the exemplary embodiment, this threaded bolt consists of a brass sleeve, and the associated attachment screw consists of special steel.

The functioning of this exemplary embodiment is as follows:

The fin 40 is inserted into the box bottom part 30 with the journal 46. In this case, the dimension of the box bottom part, and in particular the distance between the longitudinal side walls 31, is such that the journal 46 can move forwards and backwards within the box part. A lateral movement of the journal in relation to the box bottom part is ruled out. The screw 38 is introduced into the box top part from above and is inserted through the slot 36 and screwed into the brass sleeve. Since the head of the screw is wider than the width of the slot, the journal of the fin is thus moved in the direction of the intermediate plate.

The height of the journal, viewed parallel to the longitudinal axis of the screw, is preferably slightly lower than the height of the box bottom part, likewise viewed in the same direction. It is thus brought about that it is not the upper surface of the journal 46 which comes into contact against the intermediate plate, but that the upper edge 45 of the fin is pressed against the underside of the board by the force imposed by the screw.

If a seal is used between the fin and the underside of the board, the insertion opening 34 of the fin bottom box 30 and the journal 40 of the fin must be

appropriately designed so that the required pressing force for sealing is achieved when the fin is screwed.

If the fin is to be displaced in its position, it is sufficient to loosen the screw 38 slightly, displace the fin and screw it tight again.

In this exemplary embodiment, as is illustrated in Figure 7, the fin box is produced separately, preferably as a plastic injection moulding and is foamed into the surfboard during the manufacture thereof. In this manner, a very firm connection with the surfboard is produced, by means of which connection the prevailing forces can be reliably absorbed. Since the design of the fin box according to the invention ensures that the loads on the foam are imposed in total over a large area as compressive loads, the strength is considerably increased compared to known designs.

The method for the manufacture of the surfboard is then arranged in such a way that a mould to be opened is provided, which has an upper and a lower mould cavity which is designed to correspond to the contour of the basic body of the surfboard. The prefabricated fin box is inserted into the mould. Before, during or after the closing of the mould, a suitable foaming liquid is introduced into the mould, which foaming liquid expands and then completely fills the volume of the mould. The plastic upper shell and lower shell 10, 11 according to the exemplary embodiment shown in Figure 1 are usually also manufactured at the same time as the mould.

Owing to the reduced strength requirements for the fin attachment, which results from the foaming in of the prefabricated fin box, this plastic upper shell and plastic lower shell can also be omitted. The surfboard then consists in total of the foamed material, which is produced from a suitable expansion medium, and the fin box made of plastic which is recessed therein.

It is possible by suitable selection of the expansion medium, the quantity and the temperature of the production process to ensure that the surface of the surfboard manufactured in this way has the necessary properties. Furthermore, a correspondingly designed plate, which is provided, for example, in the region of the standing surface of the surfer, can also be foamed in or foamed on using the foaming process in order to increase the strength in this region.

In addition to the manufacturing mould with a separately manufactured fin box, a corresponding mould can also be manufactured by laminating directly during the manufacture of the surfboard, as will now be described with reference to Figure 5 and Figure 6.

In this embodiment, an upper opening 50 and a lower opening 51 are milled into the surfboard after the foaming operation, as can be seen in Figure 5a.

The dimensions of these cuts are selected such that the external dimensions of the finished fin box result therefrom.

Subsequently, glass-fibre mats 53 are placed in these openings, as can be seen in Figure 5c and Figure 5d, these glass-fibre mats being impregnated with the appropriate plastic material. The glass-fibre mats are preferably inserted when, in particular, the plastic bottom part which, in this exemplary embodiment, preferably likewise consists of glass-fibre-reinforced synthetic resin, still has moist laminates.

Subsequently, an aluminium moulding is then inserted which, as shown in Figure 6a to 6c, consists of a top part 60, whose upper part 61 rests on the surfboard during manufacture, and whose lower part 62 corresponds to the finished opening 34 for receiving the fin journal.

An aluminium moulding 65 corresponds to the opening 26 for receiving the screw head 39.

This aluminium moulding, as shown in Figures 5c and 5d, is inserted into the surfboard 1 and pressed against the laminates.

After the curing of the laminates, the excess laminate is cut and ground and the upper side and underside of the board are finished as usual.

The advantage of this method of manufacture is that it can be integrated in a simple manner into previously known manufacturing methods. In this case, in particular, it is not necessary to produce a separate injection moulding involving the corresponding tool costs.

In terms of construction, function and also strength, the fin box designed in this way corresponds to the fin box according to the exemplary embodiment, as was described with reference to Figures 1 to 3 and 7.

Patent Claims

1. Surfboard having an essentially elongate, flat basic body which is capable of floating and, during use, rests with its underside on the water, and on whose upper side there is provided a standing surface for the feet of the sports person using the board, at least one fin being attached to the underside, characterized in that an opening extending from the underside towards the upper side is provided in the basic body for receiving the said fin.
2. Surfboard according to Claim 1, characterized in that the extent of the said opening in the transverse direction of the board, that is to say transversely to the direction of travel and transversely to the surface plane of the fin, is less than the cross-section of the fin, and in that the outer edges of the fin cross-section at the connection point to the board are designed in such a way that the outer edges rest essentially completely against the underside of the board.
3. Surfboard according to Claim 1 or 2, characterized in that the fin is attached in the said opening by an attachment means.
4. Surfboard according to Claim 1, 2 or 3, characterized in that the said opening has a longitudinal extent essentially in the longitudinal direction of the board, which is greater than the extent of the attachment means in the longitudinal direction, so that the attachment means and the fin can be moved in the longitudinal direction in the said opening when the said attachment means has been loosened.
5. Surfboard according to Claim 3 or 4, characterized in that the said attachment means is a screw which is provided with a screw head, and in that the said opening has a resting surface on which the said screw head rests in order to hold the said fin.

6. Surfboard according to at least one of Claims 1 to 5, characterized in that the said opening is designed in the form of a fin box which penetrates the said basic body.

7. Surfboard according to Claim 6, characterized in that the said fin box has a box top part which is open towards the upper side of the surfboard, and a box bottom part which is open towards the underside of the said surfboard, and in that a plate is arranged between the said fin top box and the said fin bottom box, in which plate the said opening is provided, and through which the said attachment means engages.

8. Apparatus according to Claim 7, characterized in that the said box top part consists of two opposite side walls which are arranged essentially parallel to the longitudinal direction of the surfboard and which are connected to one another by two shorter cross walls.

9. Surfboard according to at least one of Claims 6 to 8, characterized in that the said box bottom part has two longitudinal walls running essentially parallel to the longitudinal direction of the surfboard and two short cross walls which connect the latter.

10. Apparatus according to at least one of Claims 1 to 9, characterized in that the said fin has a journal which engages in the said opening.

11. Apparatus according to Claim 10, characterized in that the said journal is of essentially cuboid design, and in that the said opening in the said box bottom part is designed in such a way that, in the assembled state of the said fin, the side walls of the said journal rest essentially against the side walls of the said fin box.

12. Apparatus according to at least one of Claims 1 to 11, characterized in that a seal is provided between the surface of the fin, which faces the underside of the surfboard, and the surfboard.

13. Apparatus according to at least one of Claims 1 to 12, characterized in that an opening provided with a threaded bore is provided in the said fin for engagement of an attachment means provided with a threaded bore.

14. Method for the manufacture of a surfboard having an essentially elongate, flat basic body which is capable of floating and, during use, rests with its underside on the water, and on whose upper side there is provided a standing surface for the feet of the sports person using the board, characterized in that an opening extending from the underside towards the upper side is provided in the basic body for receiving a fin, the said opening being formed in a moulding which is manufactured independently of the surfboard and which is integrated therein during the manufacture of the surfboard.

15. Method according to Claim 14, characterized in that the surfboard is manufactured by the said moulding being inserted into a mould which has a mould cavity which essentially corresponds to the shape of the said basic body, and in that, after the said moulding has been inserted into the mould, the mould is closed, a foaming medium being introduced into the mould before, during or after the closure of the mould, which foaming medium expands in the mould cavity and, in the process, essentially forms the said basic body.

16. Method according to Claim 15, characterized in that the said foaming medium is of such a type and is introduced into the said mould cavity in such a quan-

tity that the foam produced essentially completely forms the said basic body.

17. Method according to Claim 15, characterized in that at least one body consisting of plastic material which, in the finished state, forms at least part of the outer surface of the surfboard, is placed in the said mould.

18. Method for the manufacture of a surfboard according to one of Claims 13 to 17, characterized in that the said moulding is designed as a fin box, and in that the said fin box is manufactured from plastic material in a plastics manufacturing method.

19. Method according to Claim 18, characterized in that the said plastics manufacturing method is an injection-moulding method.

20. Method for the manufacture of a surfboard according to at least one of Claims 1 to 13, characterized in that firstly the basic body of the surfboard consisting of a plastic upper shell, plastic lower shell and foam located between them is manufactured at least to a great extent, in that cutouts are then made in the said basic body, and in that laminates are then introduced into the said cutouts, which laminates, in the cured state, form a fin box.

21. Method according to Claim 20, characterized by the use of mouldings which preferably consist of aluminium and which are arranged in the said cutouts with the said laminates in such a way that, in the cured state, the laminates have the desired shape after removal of the said mouldings.

Abstract

Surfboard having an essentially elongate, flat basic body which is capable of floating and, during use, rests with its underside on the water, and on whose upper side there is provided a standing surface for the feet of the sports person using the board, and in which at least one fin is attached to the underside. An opening extending from the underside towards the upper side is provided in the basic body for receiving the said fin, whose extent in the transverse direction of the board, that is to say transversely to the direction of travel and transversely to the surface plane of the fin, is less than the cross-section of the fin; the outer edges of the fin cross-section at the connection point to the board are preferably designed in such a way that the outer edges rest essentially completely against the underside of the board.

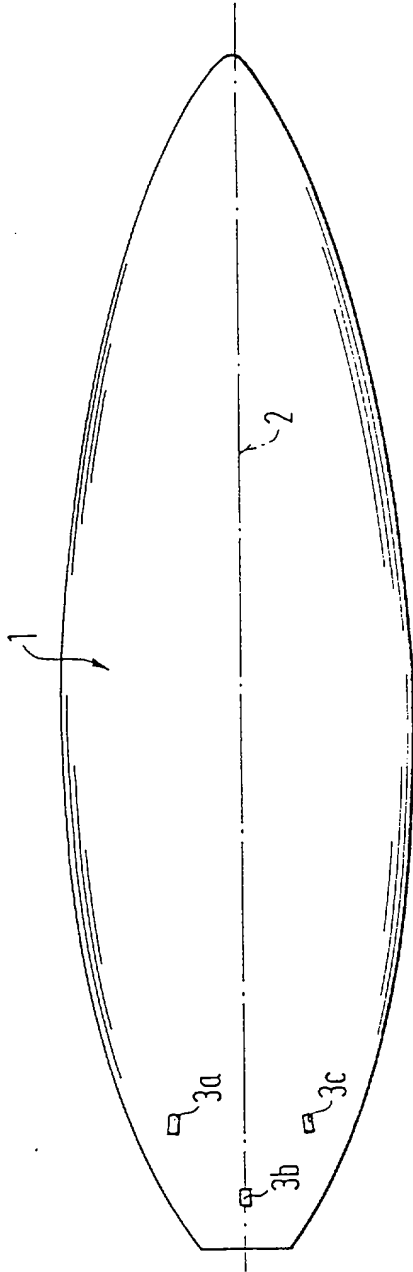


Fig. 1a

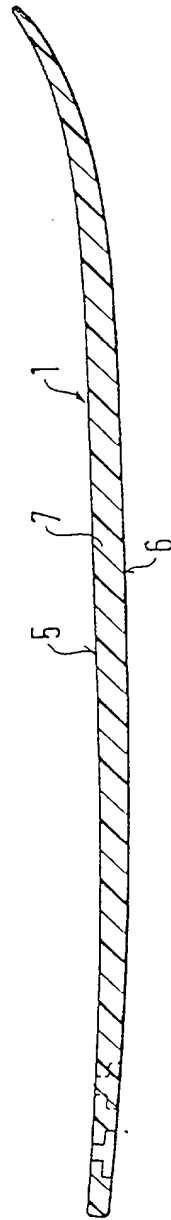


Fig. 1b

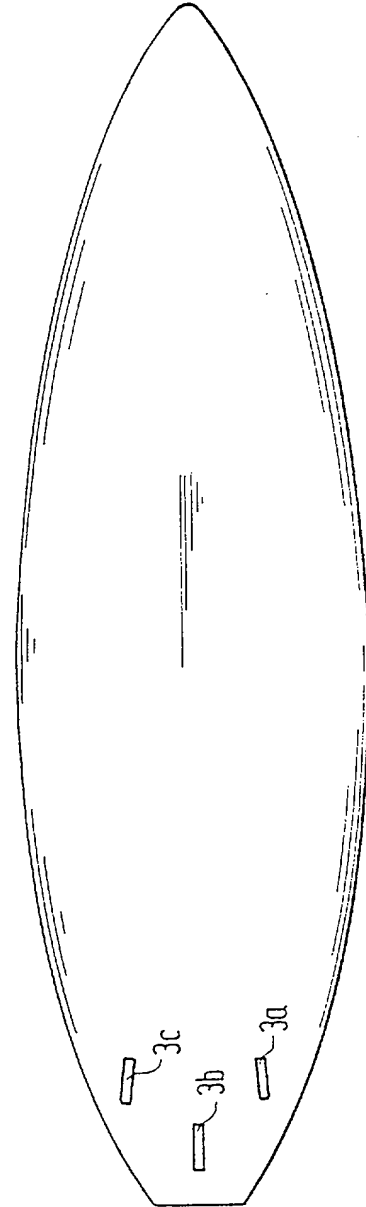


Fig. 1c

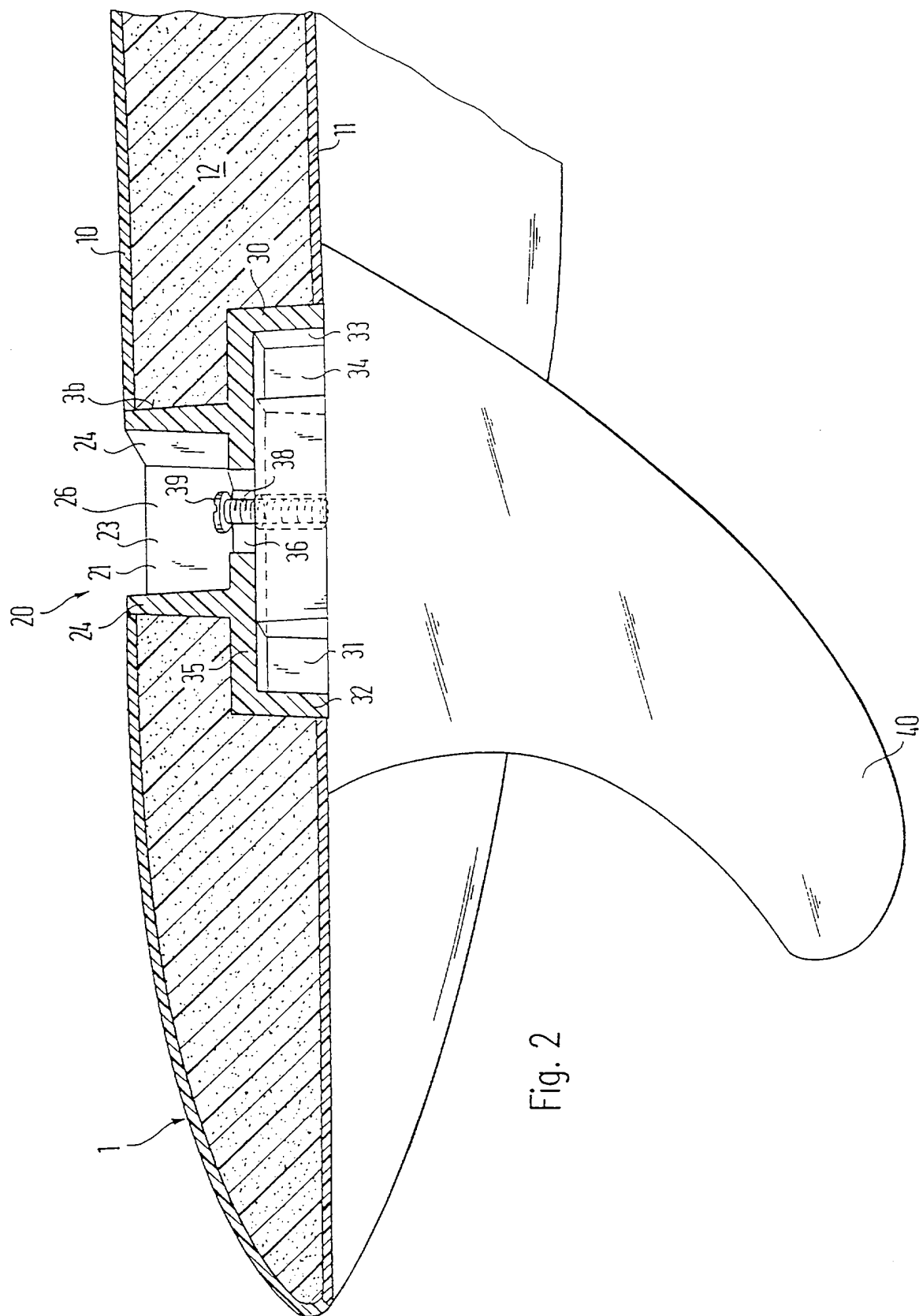


Fig. 2

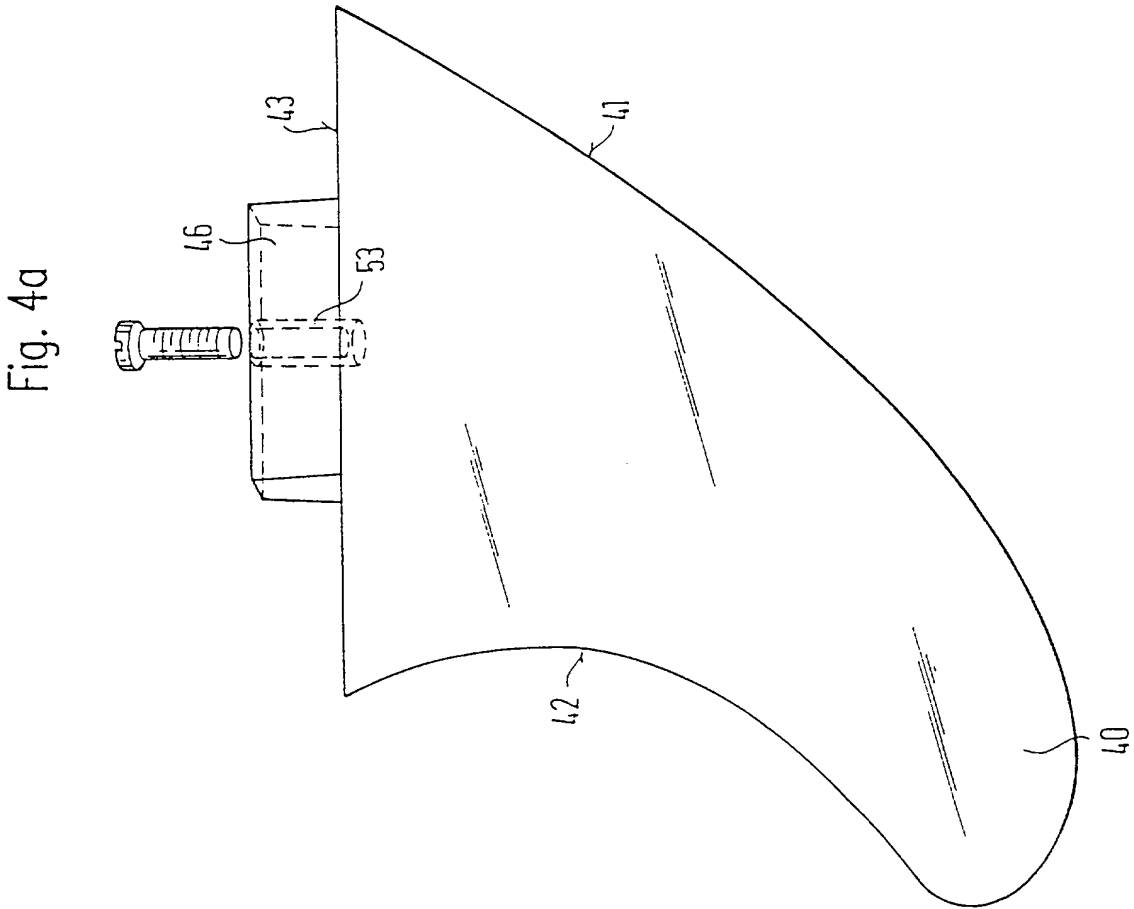
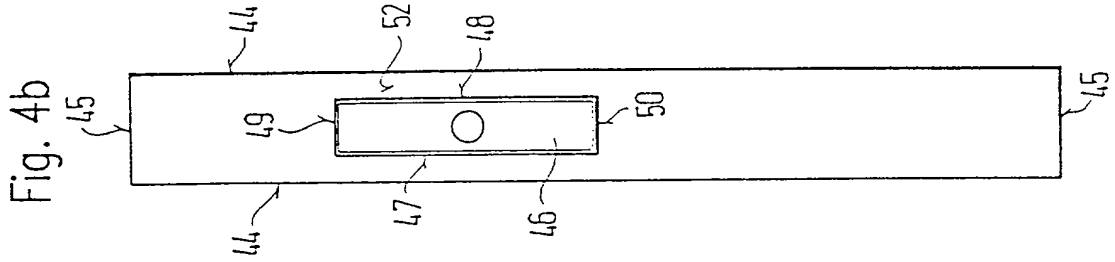


Fig. 5b

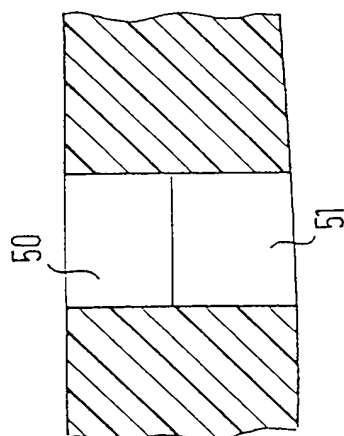


Fig. 5d

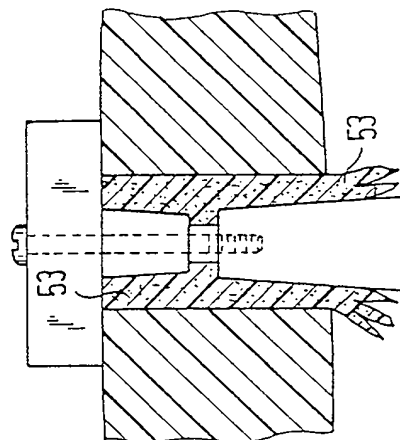


Fig. 5a

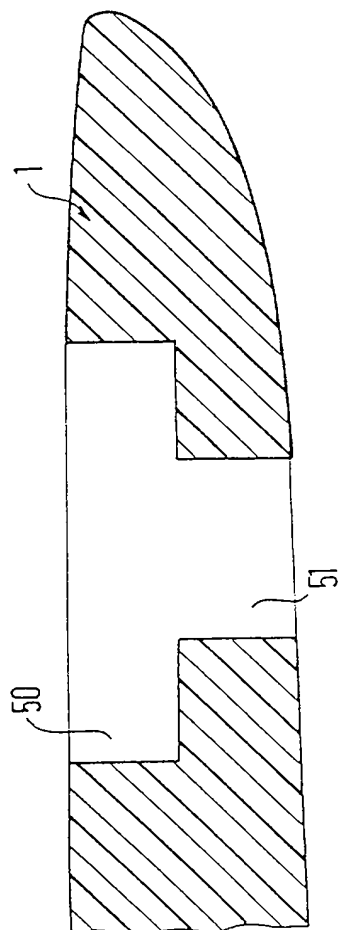


Fig. 5c

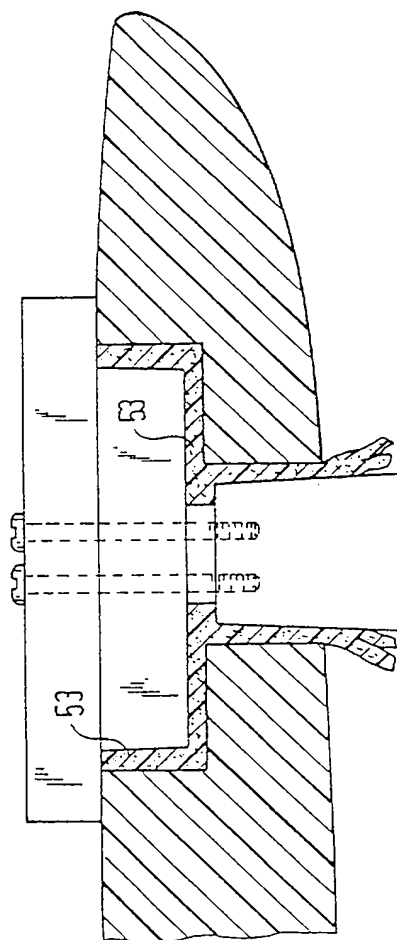


Fig. 6c

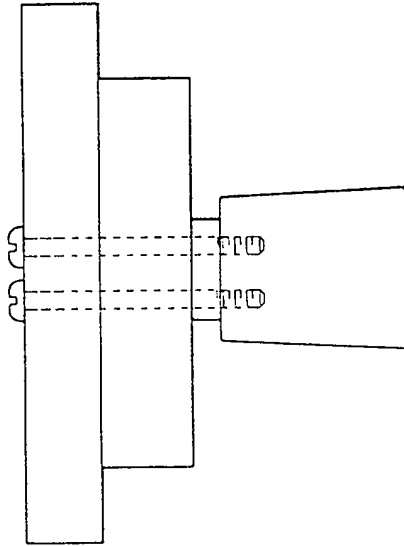


Fig. 6a

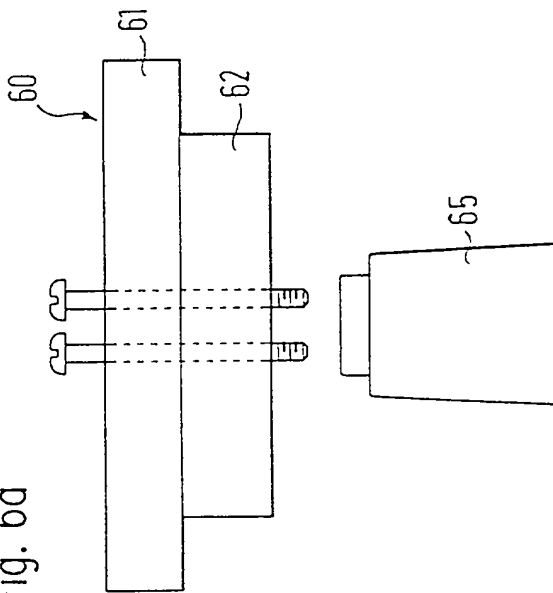


Fig. 6b

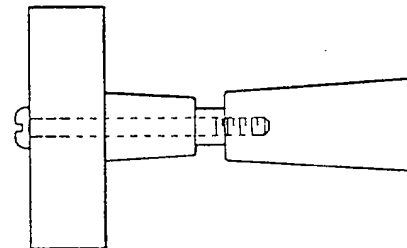
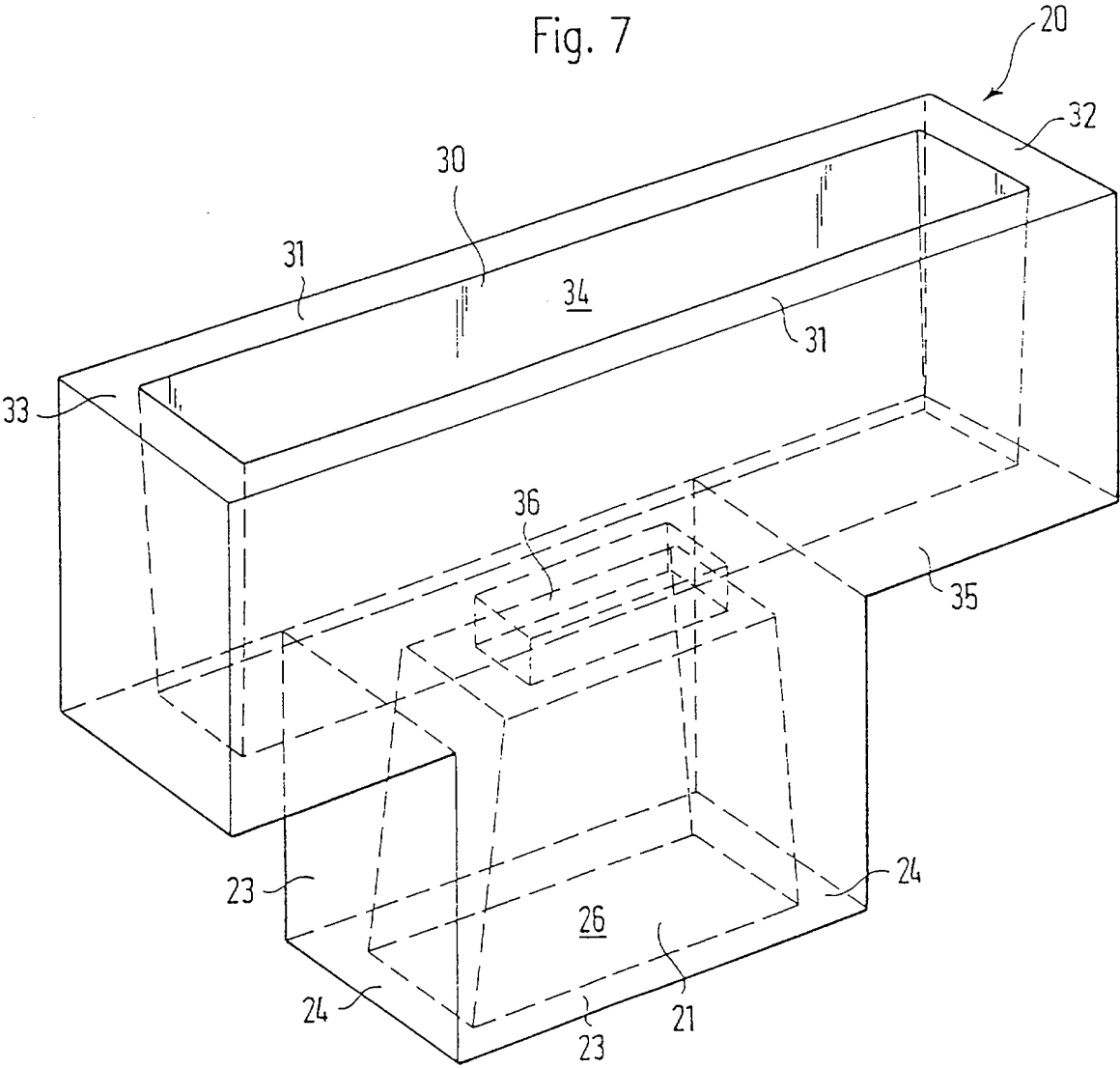


Fig. 7



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**DECLARATION FOR
UTILITY OR DESIGN
PATENT APPLICATION**☐ Declaration OR
Submitted
with Initial Filing ☒ Declaration
Submitted after
Initial Filing

Attorney Docket Number	30605
First Named Inventor	Colin Patterson
COMPLETE IF KNOWN	
Application Number	09/000,477
Filing Date	January 30, 1998
Group Art Unit	
Examiner Name	

As a below named inventor, I hereby declare that:

My residence, post office address, and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

SURFBOARD OR SAILBOARD AND METHOD FOR THE MANUFACTURE THEREOF

(Title of the invention)

the specification of which

☐ is attached hereto
OR☒ was filed on (MM/DD/YYYY)

01/30/1998

as United States Application Number or PCT International

Application Number

09/000,477

and was amended on (MM/DD/YYYY)

01/30/1998

(if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37 Code of Federal Regulations, §1.56.

I hereby claim foreign priority benefits under Title 35, United States Code §119 (a)-(d) or §365(b) of any foreign application(s) for patent or inventor's certificate, or §365 (a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or of any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached?	
				YES	NO
196 22 223.0 PCT/EP/97/02645	Germany PCT	06/03/1996 05/23/1997	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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☐ Additional foreign application numbers are listed on a supplemental priority sheet attached hereto:

I hereby claim the benefit under Title 35, United States Code §119(e) of any United States provisional application(s) listed below.

Application Number(s)	Filing Date (MM/DD/YYYY)	<input type="checkbox"/> Additional provisional application numbers are listed on a supplemental priority sheet attached hereto.

[Page 1 of 5]

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(January 1997)

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DECLARATION

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U.S. Parent Application Number	PCT Parent Number	Parent Filing Date (MM/DD/YYYY)	Parent Patent Number (if applicable)
	PCT/EP97/02645	05/23/1997	

☐ Additional U.S. or PCT international application numbers are listed on a supplemental priority sheet attached hereto.

As a named inventor, I hereby appoint the following registered practitioner(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

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James M. Moore	35788		
Paul R. Katterle	36563		
Richard M. Mescher	38242		
M. David Galin	P41767		

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Name of Sole or First Inventor:

☐ A petition has been filed for this unsigned inventor

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Post Office Address							
City	Dachau	State		Zip	85221	Country	Germany

☐ Additional inventors are being named on supplemental sheet(s) attached hereto